## Original Article

# Depressive Symptoms among Nurses in Al Maamoura Psychiatric Hospital in Alexandria, Egypt

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### Abstract

**Background:** Depression among psychiatric nurses is associated with adverse effects on their physical and mental health, as well as on their productivity and the quality of care provided for their patients.

**Objective(s):** To estimate the prevalence of depressive symptoms and to identify some of their determinants among nurses in a mental hospital in Alexandria, Egypt.

**Methods:** A cross-sectional study was conducted among 215 randomly selected psychiatric nurses in Al-Maamoura Psychiatric Hospital in Alexandria. The data was collected using a predesigned structured self-administered questionnaire along with the Arabic Version of the Beck Depression Inventory-II (BDI-II).

**Results:** The age of the sampled nurses ranged from 22 to 59 years, and most of them were females (88.8%). More than one-third (37.2%) of the nurses had depressive symptoms of variable severity, ranging from mild (28.4%) to severe (1.8%) symptoms. "Moderate/ Severe" depressive symptoms were estimated to be 8.8% among psychiatric nurses. Females with "Moderate/ Severe" depressive symptoms were more than the double of the males (9.4% Vs 4.2% respectively). Logistic regression analysis revealed two significant predictors of moderate/ severe depressive symptoms among psychiatric nurses: few social networks (OR=9.257, 95% CI=1.991-43.051), and job title "nurse" (OR=0.107, 95% CI=0.012-0.924).

**Conclusion:** Depressive symptoms of varying severity represent a mental health challenge among psychiatric nurses. Indicated interventions addressing social support networks, psychological well-being, and occupational factors would promote the mental health resilience of psychiatric nurses and decrease the negative impact of depressive symptoms among them.

*Keywords:* Depressive symptoms, psychiatric nurses, psychiatric hospitals, prevalence, determinants, Egypt

## INTRODUCTION

Depression is one of the most prevalent mental disorders, that significantly contributes to the global burden of disease, and it is considered a serious public health issue. [1,2]

Depression involves a persistently depressed mood or loss of interest in previously pleasurable activities. The symptoms of depression can range from mild to severe, including sadness, low self-esteem, despair, and worthlessness. It has an impact on a person's thoughts, feelings, and behaviors; it can result in a variety of physical and mental symptoms, including tiredness, altered appetite, sleep difficulties, poor concentration, and feelings of excessive guilt or feelings of inadequacy. [1]

Globally, an estimated 5% of adults (4% among males, 6% among females) experience depression. In Egypt, prevalence rate of depression was estimated to be 5.5% among adults aged 20-54 years in 2019 (4% among males, 6.9% among females). Worldwide, depressive disorders accounted for the largest proportion of mental disorders' Disability Adjusted Life Years (DALYs) (37.3%) and ranked the 2nd among the top 25 leading causes of Years Lived with Disability (YLD), [2,3] with low- middle-income countries sharing more than 80% of this burden. [4] Moreover, depression is one of the main causes contributing significantly to the mortality from suicide. Suicide is the fourth leading cause of death in adults aged 15-29 years old, and it was estimated that more than 700,000 people die due to suicide every year. [1] In Egypt, depressive disorders were ranked as first leading cause of DALYs among adults aged 20-24 years old in both sexes and were consistently reported among the top 10 leading causes of DALYs

among adults aged 20-64 years old, in 2019. [2,3]

Depression has detrimental effects on health as it has serious negative effects on one's physical and mental well-being. Furthermore, it has tremendous impact on different aspects of life, affecting social interactions with friends, family and society, resulting in occupational and interpersonal dysfunction and psychological distress. [1]

Within the healthcare system, nursing is invariably considered to be a stressful profession, and prior research has indicated that depression may particularly be a pervasive problem among nurses as they deal with a variety of occupational stressors (such as a heavy workload, insufficient patient care time, irregular work schedules, poor work environments, and challenging patients). [5] In Canada, 1 in 10 nurses show depressive symptoms. [6]

One of the most demanding professions is psychiatric nursing, that exposes nurses to work-related stress, depression, and anxiety. [7] Psychiatric nurses deal with emergency situations and forced admissions, interact with very ill patients who have complicated needs, and frequently have direct confrontation with aggressive behaviors. [8] A Japanese study found that 37% of psychiatric nurses had depressive symptoms. [9] In Saudi Arabia, depression was measured among mental health workers, and the findings revealed that 8.6% of psychiatric nurses had severe depression. [10]

Several factors are reported as predictors of depression among psychiatric nurses including the educational level, daily sleep time, weekly working hours, physical condition, problems with supervisors, and overtime leading to family problems. [11-13]

In Egypt, most of the psychiatric epidemiological studies have focused on psychiatric patients, but there is little attention to the mental health of psychiatric nurses. In order to maximize the role of the psychiatric nurse towards caring of mentally ill patients, more research is needed regarding their mental health. Therefore, this study aimed to estimate the prevalence of depressive symptoms and to identify some of their determinants among psychiatric nurses in Al-Maamoura Psychiatric Hospital in Alexandria, Egypt.

## METHODS

A cross-sectional study was conducted in the period from November 2020 till September 2021 targeting psychiatric nurses in Al-Maamoura Psychiatric Hospital in Alexandria, affiliated to the General Secretariat of Mental Health. It is a public tertiary mental health care facility that serves Alexandria Governorate and adjacent Governorates, such as Marsa Matrouh and Beheira Governorates. Nurses of both sexes working in the psychiatric in-patient units were included in the study. The exclusion criteria included nurses who were on training in the wards with no assigned responsibilities, as well as those who were appointed for less than three months at the beginning of the research.

**Sample Size and Sampling Methods:**
Based on a prevalence of 75.5% of severe depressive symptoms among psychiatric nurses, [14] and using alpha error=0.05, and 80% power, with 6% precision, the minimum required sample was 196 nurses. This was increased to 215 to compensate for incomplete data. The total sample included in the study was 215 nurses. The sample size was calculated using G. power 3.1.9.4 software.

The hospital had 15 male and female wards from the general, emergency, addiction, geriatric, child and adolescent, forensic, intense care and rehabilitation units. There were 10 to 20 nurses per ward. From all wards, one ward at a time was chosen using a simple random sampling technique. All nurses in the selected ward were invited to participate in the study. Then another ward was selected at random following the same procedure till the required number of nurses was reached. All wards were included to reach the above-mentioned required sample size.

**Data collection methods:**
*A predesigned structured self-reported questionnaire was used to collect the following data from the nurses:*
- Socio-demographic data: age, sex, marital status, income, and education
- Work-related data: job title, years of experience, and number of previous trainings. The job title included: nurse (who has 3 years nursing diploma, works inside wards in frequent contact with patients), nursing technician (who has 5 years nursing diploma, similar responsibilities as the nurse, but with more supervision role inside the ward), nursing supervisor (who has Bachelor's degree, works inside wards but in less frequent contact with patients and with higher supervision and training responsibilities), nursing specialist (who has Bachelor's degree, works outside wards and has more managerial duties with less frequent contact with patients), and head nurse (who has Bachelor's degree, oversees the nursing department, directly managing the nursing staff and ensuring that they follow all procedures and medical best practices). The higher position in the nursing hierarchy is determined based on the educational level and the years of experience.
- History of smoking and substance abuse.
- History of chronic diseases: such as hypertension, diabetes mellitus, liver, cardiovascular or renal diseases and other chronic diseases
- History of adverse childhood experiences before the age of 18 years old (such as parental death and

family violence), as well as current social networks.

***The Arabic Version of Beck Depression Inventory-second edition (BDI-II):*** [15] The BDI-II is a brief self-reported questionnaire that is utilized for assessing the severity of an individual's depression. It is formed of 21 multiple-choice questions which ask the respondents about different symptoms of depression. The questions correspond to DSM-IV diagnostic criteria of depressive symptoms. Each question is graded on a 4-point Likert scale ranging from ''0''= none to ''3''= severe. The test score ranges from 0 to 63 points. The Arabic Version was adapted and validated by Ghareeb [15] from Beck Depression Inventory-II. [16] In the Arabic version, mild depression ranged from 16 to 24 for males, and from 21 to 31 for females. Moderate depression ranged from 25 to 33 for males, and from 32 to 41 for females. Severe depression ranged from 34 to 63 for males and from 42 to 63 for females. Ghareeb suggested that the high depressive scores correspond to the "moderate" depression category on the Arabic Version of BDI-II. [15] In the current study, minimal and mild depression were grouped into one category "Minimal/Mild" to represent nurses with low depressive symptoms, while moderate and severe depression were combined as "Moderate/ Severe" depression to represent those with depressive symptoms of clinical significance.

**Statistical analysis:**
Data was analyzed using the Statistical Package for Social Sciences (SPSS version 20.0). The statistical analysis included testing the shape of distribution using Kolmogorov- Smirnov Test. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and percent. For all statistical procedures, the 5% level ($p \leq 0.05$) was used as cut off value for statistical significance. Chi-square ($X^2$) test was used for categorial variables, to compare between different groups, and Fisher's Exact or Mont Carlo correction were used in correction when Chi-square was invalid (when 20% or more of cells had an expected count less than 5). Binary logistic regression analysis was used to identify independent variables significantly predicting depressive symptoms.

**Ethical considerations**
Approval of the Ethics Committee of the High Institute of Public Health was obtained before conducting the study. The study was conducted in compliance with the International Guidelines for Research Ethics. Informed written consent was taken from all study participants after explanation of the purpose and benefits of the research. Anonymity and confidentiality were assured and maintained, and there was no conflict of interest.

# RESULTS

Table 1 shows socio-demographic and work-related characteristics of sampled nurses. The age of the studied sample ranged from 22 to 59 years, with a mean of 34.29±9.949 years. Most of the nurses were females (88.8%). Married nurses accounted for 71.7% of the sample, followed by those who were single (22.3%). Concerning the educational level, the majority of the sample (47%) were 3 years diploma graduates, followed by those who were 5 years diploma graduates (38.1%), while nurses with bachelor's degree constituted 14%. The largest proportion of the sampled nurses reported "not enough monthly income" (40.5%), while the least proportion reported "enough monthly income and able to save" (2.3%). The majority of nurses' titles were nursing technicians (51.1%) and nurse (36.7%).

**Table 1: Socio-demographic and work-related characteristics of sampled nurses, Alexandria, Egypt (2020-2021)**

| Characteristics | Nurses (n=215) | |
|---|---|---|
| | No. | % |
| **Age (years)** | | |
| 22– 30 | 97 | 45.1 |
| 31– 40 | 61 | 28.4 |
| 41– 50 | 42 | 19.5 |
| 51 – 59 | 15 | 7.0 |
| Min. – Max. | 22.0 – 59.0 | |
| Mean ± SD | 34.29 – 9.949 | |
| **Sex** | | |
| Male | 24 | 11.2 |
| Female | 191 | 88.8 |
| **Marital status** | | |
| Single | 48 | 22.3 |
| Married | 154 | 71.7 |
| Divorced | 5 | 2.3 |
| Widowed | 8 | 3.7 |
| **Educational level** | | |
| 3 years diploma | 101 | 47.0 |
| 5 years diploma | 82 | 38.1 |
| Bachelor's degree | 30 | 14.0 |
| Doctorate degree | 2 | 0.9 |
| **Monthly income** | | |
| Not enough + borrowing | 43 | 20.0 |
| Not enough | 87 | 40.5 |
| Enough | 80 | 37.2 |
| Enough + saving | 5 | 2.3 |
| **Job title** | | |
| Nurse | 79 | 36.7 |
| Nursing technician | 110 | 51.1 |
| Nursing supervisor | 15 | 7.0 |
| Nursing specialist | 10 | 4.7 |
| Head nurse | 1 | 0.5 |
| **Years of experience** | | |
| 1– 10 | 105 | 48.8 |
| 11– 20 | 45 | 20.9 |
| > 20 | 65 | 30.3 |
| Min. – Max. | 1.0 – 39.0 | |
| Mean ± SD | 13.874 – 10.419 | |
| **Number of training courses (last 2 years)** | | |
| None | 9 | 4.2 |
| 1 course | 48 | 22.3 |
| 2-3 courses | 75 | 34.9 |
| ≥ 4 courses | 83 | 38.6 |

**Figure 1** illustrates the distribution of sampled nurses according to their depressive symptoms. More than one-third (37.2%) of the studied sample had depressive symptoms ranging in severity from mild (28.4%) up to severe (1.8%) symptoms. The prevalence of "Moderate/ Severe" depressive symptoms among the studied nurses was 8.8%.
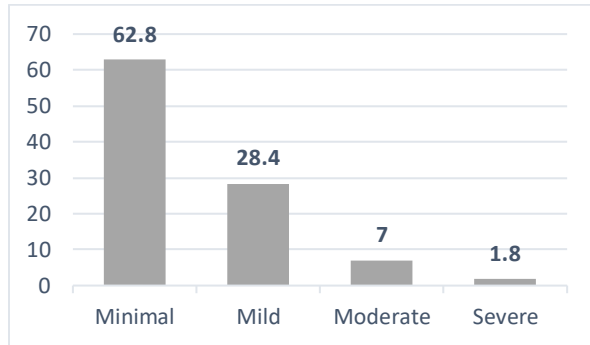


**Figure 1: Distribution of sampled nurses according to their depressive symptoms, Alexandria, Egypt (2020-2021)**

**Table 2** shows the distribution of the studied sample according to socio- demographic characteristics and depressive symptoms. Moderate/ Severe depressive symptoms were significantly more encountered among the age group 22 to 30 years compared to the older age groups 31 to 40 and 41 to 59 years (X2=6.089, p=0.048). Although moderate/ severe depressive symptoms were more encountered among female nurses (9.4%) than male nurses (4.2%), the difference was not statistically significant (*p*=0.703). As for marital status, unmarried nurses had significantly higher moderate/ severe depressive symptoms than married nurses (16.4% and 5.8% respectively, $X^2$=6.036, *p*=0.014). Moreover, nurses with 5 years diploma had the highest rate of moderate/ severe depressive symptoms (15.9%), followed by those with 3 years diploma (5.0%), and least among nurses with bachelor's/doctorate degree (3.1%), and the difference was statistically significant ($X^2$=8.201, *p*=0.017). Psychiatric nurses' monthly income was not found to be significantly associated with their moderate/ severe depressive symptoms (p=0.139).

**Table 2: Distribution of the sampled nurses according to their depressive symptoms and demographic and socio-economic characteristics, Alexandria, Egypt (2020-2021)**

| Socio-demographic characteristics | Score on BDI-II | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | Minimal/ Mild (n = 196) | | Moderate/ Severe (n = 19) | | | |
| | No. | % | No. | % | | |
| **Age (years)** | | | | | | |
| 22– 30 | 84 | 86.6 | 13 | 13.4 | | |
| 31– 40 | 56 | 91.8 | 5 | 8.2 | 6.089 | 0.048* |
| 41– 59 | 56 | 98.2 | 1 | 1.8 | | |
| **Sex** | | | | | | |
| Male | 23 | 95.8 | 1 | 4.2 | 0.732 | FEp= 0.703 |
| Female | 173 | 90.6 | 18 | 9.4 | | |
| **Marital status** | | | | | | |
| Married | 145 | 94.2 | 9 | 5.8 | 6.036* | 0.014* |
| Unmarried | 51 | 83.6 | 10 | 16.4 | | |
| **Educational level** | | | | | | |
| 3 years diploma | 96 | 95.0 | 5 | 5.0 | | |
| 5 years diploma | 69 | 84.1 | 13 | 15.9 | 8.201* | 0.017* |
| Bachelor's / doctorate degree | 31 | 96.9 | 1 | 3.1 | | |
| **Monthly income** | | | | | | |
| Not enough and borrowing | 36 | 83.7 | 7 | 16.3 | | |
| Not enough | 80 | 92.0 | 7 | 8.0 | 3.945 | 0.139 |
| Enough/ enough and saving | 80 | 94.1 | 5 | 5.9 | | |

$X^2$: Chi square test, FE: Fisher Exact, *p ≤ 0.05

**Table 3** shows the distribution of the studied sample according to work-related variables and depressive symptoms. Moderate/ severe depressive symptoms were more evident among nursing technicians (14.5%), followed by nursing supervisors (6.7%), then nurses (2.5%). None of the head nurses or nursing specialists showed moderate/ severe depressive symptoms (0.0%), and the difference was statistically significant ($X^2$=9.518, *p*=0.042). Regarding years of experience, there was an inverse relation between moderate/ severe depressive symptoms and years of experience.

Moderate/ severe depressive symptoms were significantly associated with the least number of years of experience (1 to 10 years) in comparison to having 11-20 years or more than 20 years of experience (13.3%, 8.9%, 1.5% respectively, $X^2$=6.933, *p*=0.031). As for number of training courses within the past 2 years, moderate/ severe depressive symptoms were more seen among those who did not have any training courses (33.3%) than those who had 2-3 training courses (10.7%), or those who had one training course (6.3%), revealing no statistically significant difference (*p*=0.070).

**Table 3: Distribution of the sampled nurses according to their depressive symptoms and work-related variables, Alexandria, Egypt (2020-2021)**

| Work-related variables | Score on BDI-II | | | | $\chi^2$ | $^{MC}p$ |
| --- | --- | --- | --- | --- | --- | --- |
| | Minimal/ Mild (n = 196) | | Moderate/ Severe (n = 19) | | | |
| | No. | % | No. | % | | |
| **Job title** | | | | | | |
| Nurse | 77 | 97.5 | 2 | 2.5 | | |
| Nursing technician | 94 | 85.5 | 16 | 14.5 | | |
| Nursing supervisor | 14 | 93.3 | 1 | 6.7 | 9.518* | 0.042* |
| Nursing specialist | 10 | 100.0 | 0 | 0.0 | | |
| Head nurse | 1 | 100.0 | 0 | 0.0 | | |
| **Years of experience** | | | | | | |
| 1– 10 | 91 | 86.7 | 14 | 13.3 | | |
| 11– 20 | 41 | 91.1 | 4 | 8.9 | 6.933* | 0.031* |
| >20 | 64 | 98.5 | 1 | 1.5 | | |
| **Number of training courses (last 2 years)** | | | | | | |
| None | 6 | 66.7 | 3 | 33.3 | | |
| 1 course | 45 | 93.8 | 3 | 6.3 | | |
| 2-3 courses | 67 | 89.3 | 8 | 10.7 | 6.531 | 0.070 |
| 4+ courses | 78 | 94.0 | 5 | 6.0 | | |

$X^2$: Chi square test, MC: Monte Carlo, *p $\leq$ 0.05

**Table 4** shows the distribution of the studied sample according to some physical and mental health related variables and depressive symptoms. Moderate/ severe depressive symptoms were higher among nurses with a history of chronic diseases (11%) compared to those without such history (7.7%), however, the difference was not statistically significant (*p*=0.432). The table indicates that moderate/ severe depressive symptoms were more common among nurses who were current smokers/ex-smokers than those who had never smoked (13.5% and 8.5% respectively, *p*=0.628). Regarding substance abuse, moderate/ severe depressive symptoms were evident among nurses who have abused any drug at least once (25%) compared to

8.2% among nurses who have never abused any drug, and the difference was not statistically significant (*p*=0.150). Concerning the presence of life stresses before 18 years of age, moderate/ severe depressive symptoms were more encountered among nurses who suffered parental death (17.9%), followed by those who suffered family violence (9.3%), compared to those who did not suffer any life stresses (7.2%). These differences were not statistically significant (*p*>0.05). As for social networks, moderate/ severe depressive symptoms revealed significant association with the presence of few social networks (37.5%) compared to those having moderate or many networks (7.4%, 5.7% respectively, $X^2$=17.813, *p*<0.001).

**Table 4: Distribution of the sampled nurses according to their depressive symptoms and some physical and mental health related variables, Alexandria, Egypt (2020-2021)**

| Physical and mental health related variables | Score on BDI-II | | | | $\chi^2$ | p |
| --- | --- | --- | --- | --- | --- | --- |
| | Minimal/ Mild (n = 196) | | Moderate/ Severe (n = 19) | | | |
| | No. | % | No. | % | | |
| **History of chronic diseases** | | | | | | |
| No | 131 | 92.3 | 11 | 7.7 | 0.618 | 0.432 |
| Yes | 65 | 89.0 | 8 | 11.0 | | |
| **Smoking status** | | | | | | |
| Never smoked | 183 | 91.5 | 17 | 8.5 | 0.405 | $^{FE}$p= 0.628 |
| Current smoker/Ex-smoker | 13 | 86.7 | 2 | 13.3 | | |
| **Substance abuse at least once** | | | | | | |
| No | 190 | 91.8 | 17 | 8.2 | 2.694 | $^{FE}$p= 0.150 |
| Yes | 6 | 75.0 | 2 | 25.0 | | |
| **Adverse childhood experiences** + | | | | | | |
| No | 141 | 92.8 | 11 | 7.2 | 1.649 | 0.199 |
| Parental death | 23 | 82.1 | 5 | 17.9 | 3.251 | $^{FE}$p=0.081 |
| Family violence | 39 | 90.7 | 4 | 9.3 | 0.014 | $^{FE}$p=1.000 |
| Others ++ | 2 | 100.0 | 0 | 0.0 | 0.196 | $^{FE}$p=1.000 |
| **Social networks**# | | | | | | |
| Many | 99 | 94.3 | 6 | 5.7 | | |
| Moderate | 87 | 92.6 | 7 | 7.4 | 17.813* | <0.001* |
| Few | 10 | 62.5 | 6 | 37.5 | | |

$X^2$: Chi square test, FE: Fisher Exact, *p $\leq$ 0.05, +Multiple response variable, ++ Other life stressors: parental illness, sibling death, #Few = 1-2 friends, moderate=3-4 friends, many=4 or more friends

**Table 5** displays the results of binary logistic regression analysis of significant predictors of moderate/ severe depressive symptoms among the studied sample. Based on the findings of univariate analysis, six variables were introduced for the binary logistic regression, namely; age, educational level, job title, social status, years of experience and social networks. Results showed that two variables proved to be significant predictors of moderate/ severe depressive symptoms which were: few social networks as a risk factor (OR=9.257, 95% CI=1.991-43.051), and job title "nurse" as a protective factor (OR=0.107, 95% CI=0.012-0.924).

**Table 5: Multivariate binary logistic regression analysis for the variables associated with depressive symptoms among psychiatric nurses, Alexandria, Egypt (2020-2021)**

| Independent variables | Multivariate binary logistic regression | |
|---|---|---|
| | p | OR (LL – UL 95% C.I) |
| **Age (years)** | | |
| 22– 30 | 0.545 | 3.641 (0.055 – 239.983) |
| 31– 40 | 0.571 | 2.834 (0.077 – 104.194) |
| 41– 59 (R) | | 1.000 |
| **Educational level** | | |
| 3 years diploma (R) | | 1.000 |
| 5 years diploma | 0.816 | 1.269 (0.170 – 9.461) |
| Nursing bachelor / doctorate | 0.239 | 0.221 (0.018 – 2.717) |
| **Job title** | | |
| Others+ (R) | | 1.000 |
| Nurse | 0.042* | 0.107 (0.012 – 0.924) |
| **Social status** | | |
| Married (R) | | 1.000 |
| Not married | 0.492 | 1.505 (0 .469 – 4.836) |
| **Years of experience** | | |
| 1– 10 (R) | | 1.000 |
| 11– 20 | 0.138 | 5.530 (0.577 – 52.969) |
| >20 | 0.820 | 1.603 (0.028 – 92.880) |
| **Social networks** | | |
| Many (R) | | 1.000 |
| Moderate | 0.817 | 1.151 (0.350 – 3.788) |
| Few | 0.005* | 9.257 (1.991 – 43.051) |

OR: Odd's ratio, (R): reference group, C.I: Confidence interval, LL: Lower limit, UL: Upper Limit, *p ≤ 0.05, +Other nurses' job titles ( nursing technician, nursing supervisor, nursing specialist, head nursing)

## DISCUSSION

The current work assessed depressive symptoms among psychiatric nurses working in the largest public psychiatric hospital in Alexandria (Al-Maamoura Psychiatric Hospital). Findings revealed that, the prevalence of moderate/ severe depressive symptoms according to BDI-II among the studied psychiatric nurses was 8.8%, with gender disparity (9.4% in females vs. 4.2% in males). A near lower percentage (4%) was reported in Ghana by Agyemang et al. (2022) using BDI. [13] Slightly higher percentages were reported in two studies in Taiwan; Lin et al. (2010) reported a rate of 14.9% among female psychiatric nurses using BDI-II, [17] and Wang et al. (2015) estimated a total rate of 15.6% among male and female psychiatric nurses using the Taiwanese Depression Questionnaire. [18] Moderate to severe depression among psychiatric nurses was much higher (25%) in an Iranian study by Taghfa et al. (2014), using BDI. [19] Also, an Egyptian study by Hasan (2017) in Port-Said Mental Health Hospital found a remarkably higher prevalence of moderate/ severe depressive symptoms among psychiatric nurses (92.8%), using BDI-II. [14] The

differences between the current study and that of Hasan may be attributed mainly to methodological factors as the latter categorized nurses' scores on BDI into only mild, moderate and severe overlooking the minimal category resulting in probable overestimation of the moderate to severe group. In a more recent Egyptian study conducted by Ahmed et al., (2024) among psychiatric nurses in Sharkia Governorate reported that 66% of the studied nurses had depressive symptoms, where those mild/ moderate depression represented 48%, and 18% of nurses had severe depressive symptoms using BDI. [12]

A recent systematic meta-analytic review of Iranian studies assessing prevalence of depression among nurses, conducted by Hemmati et al. (2021), found that the prevalence of moderate/ severe depression was 36% according to the BDI, 28%, according to Depression Anxiety Stress Scales-21, and 52% according to General Health Questionnaire-28. The review highlighted significant variability in reported prevalence of depressive symptoms among nurses, which underscores the impact of assessment tools on reported rates. [20]

In comparison to the prevalence estimates of depressive disorders among the general population in

Egypt (5.5%) as reported by the Global Burden of Disease study (2019), [3] the current rate of moderate/ severe depressive symptoms among psychiatric nurses (8.8%) indicates a higher magnitude of the problem among this sector of healthcare professionals.

Regarding gender difference, Cheung and Yip (2016) found that female nurses had higher prevalence of depressive symptoms than male nurses (36.6% vs. 30.3% respectively), while moderate/ severe depression was nearly equal among them (23.7% vs. 23.6% respectively), and gender was not found to be a significant predictor for depressive symptoms. [21] This finding is similar to current findings and in line with other studies as well. [13, 22] On the other hand, Zhang et al. (2022) found that gender is a significant determinant of depression among psychiatric nurses, with male nurses having a significant higher prevalence of depression than female nurses (21.81% vs. 16.06% respectively). [23] There is inconsistency between studies concerning the prevalence of depression among female and male nurses, although the literature agrees that depression is more prevalent among women in general population. [24]

In general, the wide variabilities in prevalence rates of depressive symptoms among psychiatric nurses in different studies might be attributed to difference in cultures and contexts, working conditions and policies, as well as difference in study designs and the use of assessment tools with different cutoff scores or reference diagnostic criteria. Differences in target population characteristics also play an important role, e.g., gender, ages, work experiences, job description and social status. Another important factor to be considered is the timing of the study as some studies have been done near the COVID-19 era, others have been done recently, or a long time ago, which affects indirectly the nurses' working and general life conditions making them more or less stressful.

In the current research, several socio-demographic factors were significantly associated with depressive symptoms. Moderate/ severe depressive symptoms were more observed among the youngest age group 22 to 30 years (13.4%) compared to the oldest age group 41 to 59 years (1.8%). This finding is in line with the current literature where younger nurses seem to be more susceptible to depression in studies by Yoon et al. (2013) and Vasconcelos et al. (2017).[25, 26] This may be explained by the fact that older nurses are more experienced and having less duties and less work-related stress. This explanation is further supported by other findings of the current study where moderate/ severe depressive symptoms were more evident among nurses with least years of experience, but completely absent among head nurses and nursing specialists.

In the current research, moderate/ severe depressive symptoms were more encountered among unmarried

nurses compared to married nurses (16.4% and 5.8% respectively). Similarly, Tarsas et al. (2018) found that marital status was a significant predictor of depression among psychiatric nurses, where unmarried ones (i.e., single and divorced/widowed) were about 10 times more likely to be at risk of depression than married ones. [27] Also, Wang et al. (2015) found that single psychiatric nurses were significantly more depressed than married ones. [18]

As for educational level, five years diploma graduates compared to three years diploma graduates as well as those with bachelor's/doctorate degree had higher rates of depressive symptoms. In partial consistency with current findings, Agyemang et al. (2022) [13] and Tsaras et al. (2018) [27] reported that psychiatric nurses who had higher levels of education were more likely to be depressed, and it was explained by the higher work responsibilities and expectations. [27] on the other hand, nurses with the highest level of education (bachelor's/ doctorate degree) had lower rates of moderate/ severe depressive symptoms compared to five years diploma and three years diploma graduates. This finding could be attributed to better knowledge, less clinical workload, and better income and social position associated with the educational level of bachelor's/doctorate degree.

Other significant factors were work-related and included the job title and years of experience. Regarding job title, moderate/ severe depressive symptoms were significantly more evident among nursing technicians (14.5%), followed by nursing supervisors (6.7%) and nurses (2.5%) and none of the head nurses or nursing specialists showed any moderate/ severe depressive symptoms. Furthermore, in the present study, job title was found to be one of the significant predictors of depression. In partial agreement with current findings, job title was significantly associated with scores of psychological distress among psychiatric nurses in a study conducted by Wang et al. (2022), where associate superintendent nurses (equivalent to specialist/ head nurses in our study) were found to have the least score. [28] In the current study, the job title "Nurse" was significant predictor of lower moderate/ severe depressive symptoms, which indicates that though nurses with high job position have probable protective factors as higher levels of education and salaries compared to nurses with lower positions, yet they are expected to show high accountability by taking the responsibility for their decisions and actions and high technical competencies.

In addition, moderate/ severe depressive symptoms were more evident among nurses with 1 to 10 years of experience (13.3%) than those with 11 to 20 years of experience and those with more than 20 years of experience (8.9% and 1.5% respectively). This may be explained by the improved coping skills

with more experience, and the decrease of work stress as stated by Al-Omar (2003) in a Saudi study. [29]

Furthermore, in the present study, the presence of few social networks was found to be a significant risk factor for depression. This is supported by many studies in the literature; Yoshizawa et al. (2016) demonstrated that social support reduced the impact of stress on depression among psychiatric nurses, [9] and Hsieh et al. (2018) showed that social support by family was protective against depressive symptoms in psychiatric nurses. [30]

### Limitations of the study

The current study has some limitations that should be considered. First, there was gender bias in the recruited sample as male nurses constituted a minority of the hospital nursing workforce and were less likely than female nurses to express enthusiasm to participate in the study. Second, the cross-sectional design did not allow the assessment of causal relationship between depressive symptoms and associated factors, which are better investigated through longitudinal studies.

## CONCLUSION AND RECOMMENDATIONS

Depressive symptoms of varying degrees of severity are prevalent among psychiatric nurses in Alexandria. The notable higher rate of moderate/ severe depressive symptoms among psychiatric nurses than the reported depression rate among the general population in Egypt reflects the influence of psychiatric nursing profession, and calls for proper attention. Social networks and job title are significant predictors of nurses' moderate/ severe depressive symptoms. Based on the findings of the current study, increasing awareness of depression among psychiatric nurses in their workplace environment through psychoeducational programs is highly recommended. Designing and implementing programs for prevention and management of depression among psychiatric nurses are necessary. Indicated interventions to enhance social support networks, psychological well-being, and occupational factors are needed to promote the mental health resilience and to decrease the negative impact of depressive symptoms among nurses. Further studies are needed to study other determinants, and different management approaches of depression among psychiatric nurses.

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